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From cryptids to kaijū: Exploring heterodox palaeoscience with Godzilla

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Abstract

This essay's goal is to elucidate the role that cryptozoology, a field related to heterodox palaeoscience, has played in Japan, via key films in the Godzilla series; a popular example of Japanese cryptozoological fiction. This will work to reframe the discussion around cryptozoology as one not premised exclusively on western cultural assumptions about the relationship between science, modernity and myth while also demonstrating that the circumstances which have resulted in the palaeontologically heterodox claims of cryptozoologists are not unique to western culture.

Keywords

cryptozoology, palaeontology, Japan, Yokai, cryptid, cryptofiction, Godzilla, kaijū, dinosaurs

As a form of heterodox palaeoscience cryptozoology is often characterised as arising from the incipient backlash of the 'capitalist societies of Western Europe and North America' finding themselves in a 'disenchanted' modernity as articulated by late nineteenth-century German sociologist Max Weber who argued that the literal belief in gods, monsters and magic was disappearing, or soon would, thanks to the inexorable march of scientific progress (Josephson-Storm 2017, 4–5). Such a conceptualisation has resulted in cryptozoology being interpreted as an attempt by the disenchanted to escape from what Weber famously called 'the iron cage of modernity' (Josephson-Storm 2017, 284–86). Under such a schema cryptozoology earns its place in historian of science Michael D. Gordin's family of 'counter establishment sciences' which exist to oppose an overly materialistic scientific mainstream (2021, 41–3). Another result of this conceptualisation, observes historian G. Clinton Godart, is the erroneous assumption that non-western countries, such as Japan, are effectively immune to fringe sciences like cryptozoology (2017, 17–27).

This article will serve as a corrective for both of these overstated contentions by exploring some of the forms which heterodox palaeoscience has assumed in Japan with a focus on cryptozoology. The aim

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here is to demonstrate that cryptozoology – understood as 'the scientification of folklore' – did not arise in opposition to eighteenth- and nineteenth-century scientific advancements in such fields as geology, palaeontology and evolutionary biology but rather as an unavoidable byproduct of them (Grimshaw and Lester 1976, 10).

To further this argument this essay will build off historian Federico Marcon's observation that 'well before the modern age, during the Tokugawa period (1600–1868), Japan began a process of desacralization of the natural environment in the form of a systematic study of natural objects that was surprisingly similar to European natural history without being directly influenced by it' (2015, x). This process did not exclude the 'mysterious and awe-inspiring supernatural creatures' of Japanese folklore 'like kappa, ningyo (sirens), and tengu' but rather fully incorporated them by seamlessly 'naturalizing' them so that they became like 'any other animal, with maps charting regional morphological differences and distribution' (2015, 9). In other words, well before contact was reestablished with the western world in 1853, Japan was already in the process of turning its supernatural monsters into scientifically plausible sounding cryptids.

In keeping with the theme of heterodox palaeoscience, this exploration of Japanese cryptozoology will be facilitated via the medium of Japan's long-running multimedia Godzilla franchise, read here as an example of cryptozoological fiction, or cryptofiction, which has its roots in the nineteenth-century tradition of the 'living fossil' genre of speculative fiction (Newton 2005, 522–36; Mullis 2019, 240–52; Fallon 2023, 1–17). And while the Godzilla movies make no claims regarding palaeontological accuracy, they are nevertheless worth paying attention to, since, as Japanese film historian Donald Ritchie notes, they often serve as 'a kind of barometer of the political mood [in Japan]' thus making them useful texts for investigating aspects of Japanese culture, including the role which heterodox palaeoscience, under the guise of cryptozoology, has taken on (2005, 178).

Moreover, Godzilla has achieved a remarkable level of international pop-culture permeance with a franchise spanning seven decades, a total of thirty live-action films produced by Japan's Toho Studios as of 2023, in addition to five live-action Hollywood films as of 2024, as well as various animated movies, TV series, comic books, video games and countless toys. The influence of Godzilla is even detectable in mainstream films like *Jurassic Park* (1993) with director Steven Spielberg describing the original *Godzilla* (Dir. Ishiro Honda, 1954) as 'the most masterful of all dinosaur movies because it made you believe it was really happening' (Shay and Duncan 1993, 15).

Anticipating objections to this approach, one might argue that the heterodox palaeoscience in Godzilla films is not the same as cryptozoology as both works are packaged and sold differently: Godzilla movies as overt fiction and cryptozoological literature as possibly true accounts of mysterious creatures. However, such an argument ignores Andrew May's astute observation that science-fiction and fringe science can be mutually reinforcing. Because the role of science in science-fiction films is often merely to lend a veneer of veracity to the fantastic events on screen, writers of such movies are just as liable to 'draw on popular pseudoscientific theories to add verisimilitude to their stories' as they are to utilise real science in them (2017, ix). In fact, this propensity for the Godzilla series to oscillate between real science and what Gordin calls 'vestigial science' will be demonstrated. Conversely, the inverse of this observation is articulated by Sharon Hill who notes that the aim of cryptozoologists and other similar fringe researchers is frequently not to engage in actual science but instead to merely present their activities in a way which 'sound sciencey' to the public (2017, 1).

Moreover, it is important to remember that most cryptozoologists are not professional scientists, which means that they are not writing for an academic audience but rather for the commercial market. This makes them beholden to the same pressures exerted on commercial science-fiction authors such as the need for eye-catching cover art and a jaunty narrative style which places heavy emphasis on entertaining anecdotes of alleged cryptid encounters over critical analysis of those

claims. Therefore, it is unsurprising that non-fiction cryptozoological texts often bear a striking resemblance to science-fiction. Because of this May astutely observes that while fields like cryptozoology are not science they can be interpreted as a 'creative undertaking—effectively a branch of the entertainment industry' (2017, viii). So, while the creators of Godzilla movies are not arguing that their monsters objectively exist, such films nevertheless serve as a space where heterodox palaeoscience ideas like cryptozoology not generally accepted by the academic mainstream can gain international public exposure. All of which creates a feedback loop in which, for instance, the heterodox palaeoscience seen in science-fiction films like Godzilla influences the thinking of cryptozoologists which in turn informs the content of future movies which influences the next generation of cryptozoologists and so forth and so on.

What follows is a brief and noncomprehensive overview of cryptozoology in Japan prior to 1900 to demonstrate that such ideas arose independently, mostly without western influence, and in accord with the development of modern science rather than in opposition to it. Next will follow a brief survey of Japanese cryptofiction prior to the release of the original *Godzilla* in 1954. This is to show that such narratives were well established in Japanese popular culture prior to the 1950s and that many of the principal artist, writers and filmmakers involved with this subgenre would eventually play a part in the creation of Godzilla. Following this will be an overview of the role of which heterodox palaeoscience has played in the Japanese Godzilla series before concluding with an illustration of how cryptofiction narratives like Godzilla influence real-world cryptozoological encounters.

Cryptozoology in Japan before 1900

'Science', Daniel Cohen once wrote, is a 'hard and restrictive' process which 'destroys' rather than affirms our most 'beloved romantic myths' (1967, 5). Cryptozoology however does the exact opposite. Rather than dismissing the monsters of our mythologies and folklore as the superstitions of an unenlightened laity, cryptozoology sees monsters as subjects worthy of scientific study. Cryptozoologists accomplish this by applying a euhemeristic hermeneutic to monster legends, effectively reimagining them as creatures who conform (mostly) to the presuppositions of modern zoology and palaeontology. A process which adorns such monsters with a veneer of scientific credibility. Or as palaeoartist John Conway nicely puts it, cryptozoology is 'entertaining the notion that legendary beasts are real animals' (Dobler 2014). Whereas residents living along deep, dark, cold freshwater lakes like Scotland's Loch Ness or Japan's Lake Ikeda in Kyushu once spoke of such bodies of water being inhabited by supernatural creatures like kelpies or other magical water-horses, today they talk about them as the dwelling place of cryptids like relic plesiosaurs, giant eels, or supersised seals (Freeman 2010, 129–30 and 205).

The Japanese have long revered the natural world as a 'sacred space' fundamentally 'inhospitable and alien to human beings'. In the Japanese imagination the 'dark forests and impenetrable mountains' which blanket their island home are populated not only 'by a variety of trees, herbs, and animals but also […] monstrous creatures like *kappa* (water goblins), *tengu* (long-nosed demons), *kitsune* (supernatural foxes), and *tanuki* (raccoon dogs)' which endeavour to trick, kidnap and sometimes kill 'all those humans who dared to enter their realm' (Marcon 2015, 3–4). In the late nineteenth-century the renowned 'Buddhist philosopher and ghostbuster' Enryō Inoue branded these monsters with the collective moniker of *yōkai* (Josephson-Storm 2019, 33–4).

Folklorist Michael Dylan Foster writes that while *yōkai* has no direct English equivalent, a case could be made for equating it with the term 'cryptid' as employed by cryptozoologists. Among their similarities, Foster notes the ambiguous status which both yōkai and cryptids occupy in their respective cultures. While some enthusiastically affirm and others emphatically deny such monsters' existence,

most people are simply content to leave the question an intriguing possibility. This is largely because both yōkai and cryptids lack 'serious scientific findings' to support their existence but do feature in numerous compelling 'anecdotal and legendary accounts' (2009, 12–3).

The only difficulty with this suggestion is that a Japanese equivalent of the English term cryptid already exists with the acronym 'U.M.A.' (pronounced: *Yūma*), which stands for Unidentified Mystery Animals, and anticipates John E. Wall's coining of the term 'cryptid' by seven years (Coleman and Clark 1999, 76; Foster 2015, 199). An obvious riff on U.F.O., U.M.A. was coined in 1976 by zoological journalist Tatsuro Saneyoshi (b. 1929) and paranormal investigator Hiroshi Minamiyama (b. 1936, who goes by the penname Yu Mori) who together popularised the field of cryptozoology in Japan during a period remembered as the Japanese 'Occult Boom' (Hirota 2021, 333).

However, the Japanese have been participating in cryptozoology well before the 1970s. As Federico Marcon observers it was during the Tokugawa period that Japanese intellectuals began their first systematic studies of the natural world grounded in the neo-Confucian concept of *Shushigaku* which advocated for the close scrutiny of all things to better 'understand the structure of nature and the proper order of society' (Nappi 2009, 27 & 138; Marcon 2015, 32–8). This, in turn, created a craze in Japan for imported 'natural history texts and pharmacopoeias from China' which then spurred the creation of the first Japanese works on the same topics (Foster 2015, 46–7).

One of the earliest Japanese natural history encyclopedias is the *Yamato honzō* (Medicinal Herbs of Japan) by Ekiken Kaibara (1630–1714) which covers a wide swath of topics including 'creatures that today we would call monsters' such as 'the kappa, or kawatarō'. Notably Marcon observes that Kaibara's description of the kappa dispenses with any supernatural characteristics and instead replies on 'the same terms as the phenomena of the natural world' (2015, 96–7). In doing this the Japanese encyclopedist had taken the first steps towards 'the scientification of folklore' which is the crux of cryptozoology.

Responding to the demand for encyclopedias, Toriyama Seikien (1712–1788), an artist born into a prominent bureaucratic family with direct ties to the Tokugawa shogunate, published four illustrated encyclopedias cataloging all of Japan's monsters: an unprecedented undertaking which resulted in the visual and narrative codification of Japan's monster folklore for all future generations. Unlike Kaibara, Seikien's aim was not scientific accuracy. Recalling May's contention that cryptozoology can be seen as 'a branch of the entertainment industry', Seikien's encyclopedias are openly fanciful and even satiric at times. In fact, the fourth and final installment in the series contains several yōkai which Seikien invented (Foster 2015, 49; Yoda and Alt 2017, vii–x). Nevertheless, some of Seiken's entries are intriguing from a cryptozoological perspective, including one from his second volume depicting the Satori; an upright hairy hominid that 'dwells deep in the mountains of Hida and Mino provinces' and which translators Hiroko Yoda and Matt Alt remark clearly seems to be 'Japan's answer to Bigfoot' (Yoda and Alt 2017, 92).

By the early nineteenth-century the Japanese study of monsters entered its most academic phase. Kurimoto Tanshū (1756–1834), the personal physician of the Shogun, was a key member of 'a team of high-ranking scholars and officials engaged in a comprehensive study of kappa' (Marcon 2015, 194–5). Marcon notes that 'rather than cataloging legends and literary references on kappa like other encyclopedias' Tanshū's team aimed to treat the kappa no different than 'any other animal, describing anatomical features, size and color, behavior, ecosystem, habits, and the like' (Marcon 2015, 195).

This project, 'titled *Suiko kōryaku* (A Study of Water Tigers), was based on hundreds of eyewitness reports and observations' which 'the team collected […] and carefully analyzed'. Based on these anecdotes Tanshū and his colleagues were persuaded that the kappa must exist as the 'reports displayed a strong consistency with a pattern of geographical variation: people of different social standings in the same region had independently experienced the same kind of encounter with a similarly shaped water

goblin'. Moreover 'the existence of kappa-like creatures was also confirmed by Chinese sources' which mentioned a similar monstrous creature. So comprehensive was the *Suiko kōryaku* that several years after its publication 'the two naturalists Sakamoto Kōnen and his brother Juntaku […] produced a broadsheet-sized schema illustrating the morphology and regional variations of kappa titled *Suiko jūnihin no zu* (Twelve Types of Water Tiger). Each illustration, faithfully taken from *Suiko kōryaku*, was accompanied by notes and information about the location of that particular species of kappa' (Marcon 2015, 195–6).

The degree to which the *Suiko kōryaku* project, and the Sakamoto sibling's resulting illustration, resembles the practices of modern-day cryptozoologists is uncanny. Furthermore, as with cryptozoology the result of this project, observes Marcon, was the complete naturalisation of the kappa: 'they became objects to be studied, understood, classified, and researched in the same manner that exotic plants and animals were' (Marcon 2015, 195). Today the kappa remains a subject of interest for some cryptozoologists as reports of the creature persist into the present (Coleman and Huyghe 1999, 138–9; Freeman 2010, 152–63).

Not everyone was persuaded that monsters like the kappa inhabited the natural world, however. Enryō Inoue (1858–1919), in addition to popularising the term yōkai, also pioneered the field of *yōkaigaku* which historian Gerald Figal translates as 'monsterology" (1999, 41). Inoue denied the objective reality of yōkai instead arguing that monsters are 'subjective errors of the human mind' resulting from the misrecognition of natural phenomena brought on by the conceptual, emotional, or volitional operations of one's own psyche. In the case of yōkai which people claimed to see or encounter in the 'outer world' Inoue accepted that there was likely an external catalyst which had triggered their experience but that ultimately 'all monsters are produced from inner mental operations' (1999, 50–1 & 86).[1]

Inoue's ideas greatly influenced early twentieth-century Japan via his appointment to the Ethics Textbook Survey Commission (1903–1945) that oversaw the contents of school textbooks as part of Japan's attempt to modernise their society following the end of the Tokugawa era. These books presented students with a list of traditional beliefs that were to be considered superstitions of an outmoded age. The following declaration, from a typical third grade textbook at the time, perfectly encapsulates Inoue's thinking on the issue of yōkai…

> 'In the world, wherever ghosts appear, or whenever there are people who say that they have seen monsters, they have created these things in their own minds. This is because so-called monsters and ghosts truly do not exist' (qtd in Josephson-Storm 2012, 241).

Religious studies scholar Jason Ā. Josephson-Storm observes that while such statements were intended to address all manner of supernatural beliefs, a survey of them reveals 'a conspicuous attempt to eliminate those supernatural creatures with dark or otherwise negative associations' such as 'ghosts, monsters, the dog-god, winged goblins, and human foxes' (2012, 242–43).[2] In other words the Ethics Textbook Survey Commission was disproportionately targeting a belief in monsters. And yet by all accounts Inoue bore no real hatred towards yōkai and as the foremost authority on *yōkaigaku* adopted the nickname *Yōkai hakase* or 'Dr. Monster' (2012, ix). It seems that while Inoue did not want people to literally believe in monsters, he nevertheless loved them and wanted to celebrate them as an important part of Japanese culture. Inoue was not the only one concerned with how Japanese traditions were fairing in the post-Tokugawa era. A contemporary of Inoue's, Oishigori Masuumi (1832–1911) was a gold prospector turned clairvoyant who had studied with mountain wizards and developed a system for reading the secret language of water ripples (Stalker 2008, 56–7). Masummi feared that Shinto was falling behind the rival faiths of Buddhism and Christianity as well as cutting-edge western scientific thought like Darwin's theory of evolution and palaeontology

which formally reached Japan in 1877 via a series of lectures delivered at the University of Tokyo by German geologist Edmund Nuamann and American zoologist Edward S. Morse (Kobayashi 1976, 1–2; Godart 2017, 17–27).

However, Masummi's solution to this dilemma was very different from Inoue's. Believing that Japanese practitioners of Shinto needed a new revelation that could directly challenge western science, he channeled 'the spirit of Hieda no Are', composer of Japan's oldest assemblage of myths; the *Kojiki* (Tatsumi 2014, 72). According to Masummi's channeled communications the Japanese were not the evolutionary descendants of early hominids as claimed by Darwinists but rather arose from dragons born of stone pebbles filled with *chi* by the gods (Tatsumi 2006, 175; Tatsumi 2014, 72). Moreover, like their dragon forebearers these first Japanese had 'a dragon's body' replete with '[scaly] skin that sparkled like gold reflecting light'.[3] Most shocking of all was that according to Masummi these 'dragons' were extant dinosaurs! In addition, not all the dinosaurs had evolved into humans. Some had remained hidden deep in the sea where they lived on as gods (Tatsumi 2006, 175–76).

These teachings became the central tenants of Ōishigori Shintoism, a kind of 'Shinto creationism' that advocated a worldview in which the Japanese are both the descendants of dinosaurs and worship dinosaurs as living-gods (Tatsumi 2014, 71–73; Godart 2017, 50). Though Ōishigori Shintoism did not endure long as 'a pseudoscientific and pseudoreligious' movement its teachings 'had a tremendous impact on one of the mystic cults, Oomoto-kyo, which was very active in the Taisho era' (Tatsumi 2006, 174). In fact, Deguchi Onisaburo (1871–1948), the founder of Oomoto-kyo, was a student of Masummi's (Stalker 2008, 56). As an expression of Japanese exceptionalism Oomoto-kyo would go on to heavily influence Japan's emerging political right-wing in the late nineteenth and early twentieth-century (Godart 2017, 58 & 156). By conflating Japanese dragons with dinosaurs Masummi too contributed to the scientification of Japan's folklore.

Japanese Cryptofiction Before *Godzilla* (1954)

An important early piece of cryptofiction was Georges Dupuy's 'The Monster of Partridge Creek', in which a band of intrepid hunters in Alaska come face-to-face with a shaggy ceratosaurus. Originally published in the French popular-science magazine *Je sais tout* (April 1908), an English translation appeared in *The Strand* the following July with multiple striking black and white illustrations. Fortean historian John LeMay has shown that despite being an overt work of fiction this story garnered widespread attention, with many readers mistaking it for an authentic account (LeMay 2020a, 15–64).[4]

Dupuy's living dinosaur tale even made it as far as Japan where it showed up in a book from that same year titled *Mysterious World: Strange Stories* that refers to the titular monster as a kaijū (Suzuki 1908, 10–11). The word kaijū (strange beast) is a Chinese loan word originating in the fourth-century BCE tome *Classic of Mountains and Seas* where it describes strange primate-like creatures called Xiao (Birrell 2000, 15).[5]

Other early examples of cryptofiction to appear in Japan included the American films *The Lost World* (Dir. Harry Hoyt, 1925) and *King Kong* (Dir. Merian C. Cooper & Ernest B. Schoedsack, 1933).[6] While these movies were well received in Japan as imports, attempts were also made to localise them for the Japanese market with comic book adaptations by the 'god of manga' Osamu Tezuka (Benzon 2011, 37–51; Derendorf 2022, 3:36). However, it was the Johnny Weissmuller Tarzan films which proved especially influential on the earliest works of Japanese cryptofiction. This may be surprising, but it should be remembered that the Tarzan series placed living dinosaurs in its mythical Africa (Barry 2002, 370–73).

Sōji Yamakawa's (1908–1992) pulp serial *Kenya Boy* (Shōnen Keniya) features a Japanese Tarzan expy named Wataru who inhabits a colonialist's fantasy version of Africa replete with marauding dinosaurs and giant snakes (Nardy 2021, 74–5). First serialised from October 1951 to October 1955, *Kenya Boy* was so popular that the *Sangyō Keizai* newspaper where it appeared became known as the 'Kenya newspaper'. In 1954 – the same year Toho unleashed their first Godzilla movie – a black-and-white film version of *Kenya Boy* was released, produced by Toho's chief rival Daiei Studios (Nardy 2021, 82; Derendorf 2022, 6:10 & 7:20). A more direct connection between *Kenya Boy* and *Godzilla* (1954) is that Yamakawa was the mentor of Wasuke Abe; the artist who designed Godzilla (Derendorf 2022, 5:19–5:30).

Meanwhile in the US, the summer of 1952 saw the re-release of *King Kong* in theaters. This inspired other studios to produce similar films about monsters (Warren 2017, 10). Among the first films to capitalise on the return of Kong was Warner Brother's *The Beast from 20,000 Fathoms* (Dir. Eugène Lourié, 1953) about a dinosaur-like creature that attacks New York City after being awakened by a nuclear test in the Antarctic. *Beast* was a box office hit both domestically and internationally. In Japan the film was scheduled for a December 1954 release by Daiei under the title *An Atomic Kaijū Appears* (*Genshi Kaijū Arawaru*). Eager to beat their competition to the box office, Toho rushed their own monster movie into pre-production in early May with a slated November release ahead of *Beast*. This movie was, of course, *Godzilla* (1954).

Toho producer Tomoyuki Tanaka hired award-winning science-fiction author Shigeru Kayama (1904–1975) to develop the initial story treatment for *Godzilla*. Kayama was well known for his stories about monsters, an outgrowth of a childhood love of dinosaurs (Angles 2023, 190). Kayama's work was primarily aimed at a young adult audience with many of his stories featuring accompanying illustrations by cartoonist Kazuyoshi Abe whose early concept art of Godzilla would later be passed off to Wasuke Abe for final rendering (Ryfle 1998, 22).

Prior to his work on *Godzilla*, Kayama was best-known for a pair of cryptozoological short stories titled 'The Revenge of Orang Pendek' (*Oran Pendeku no fukushu*) and its sequel 'The Fate of Orang Pendek' (*Oran Pendeku no gojitsutan*); published in April of 1947 and January of 1948 respectively (Schnellbächer 2007, 30–1; Angles 2023, 190–91). In the annals of cryptozoology, the Orang Pendek is a Sumatran ape-man first reported in the early 1910s (Coleman and Huyghe 1999, 146–47). However, it was a different short story by Kayama that likely caught Tanaka's attention. Published in 1952, Kayama's 'Jira Monster' concerns a dinosaur-like creature immune to bullets that terrorises the inhabitants of an island in the South Pacific (Baker and Liew 2019, 12).

Beast was also based on a short story of the same name (but subsequently retitled 'The Foghorn') by celebrated American science-fiction author Ray Bradbury. Originally published in the June 1951 *Saturday Evening Post*, *Beast* appeared alongside a striking illustration by James Bingham showing a bipedal dinosaur with serrated dorsal plates attacking a lighthouse. However, Bradbury's story lacks the nuclear element seen in the Warner Brothers film, and inherited by *Godzilla*, and thus constitutes a more cryptozoological take since the dinosaur is merely a 'prehistoric survivor'; one of the most important tropes in cryptozoology (Naish 2017, 38).

This is significant as three years prior to the publication of Bradbury's story, *The Saturday Evening Post* had run an article by Scottish-born naturalist Ivan T. Sanderson titled 'There Could Be Dinosaurs' which, like Yamakawa's *Kenya Boy*, dealt with early twentieth-century rumors of living dinosaurs in colonial Africa albeit in a purportedly nonfiction context (1948, 17, 53, 56). Sanderson's article was largely based on information recycled from German American science-writer Willy Ley's *The Lungfish and the Unicorn*.[7] A 1941 review of Ley's book in the *New York Times* referred to it as a work of 'cryptozoology'; the first time that word had seen print (Loxton and Prothero 2013, 16–7). It was also Sanderson's article that inspired Belgian-French zoologist Bernard Heuvelmans to write his book *On the Track of Unknown*

Animals (FRAN. 1955, US. 58) which formally introduced cryptozoology to the world. Though there is no evidence that Bradbury was inspired by Sanderson's article it is nevertheless striking that both works should appear in the same conceptual space, *The Saturday Evening Post*, and that the origins of cryptozoology should be so closely tied to those of Godzilla.

Cryptozoology in the Godzilla Franchise

The original *Godzilla* opens amidst reports of fishing trawlers mysteriously disappearing off the coast of Japan. When some of the survivors wash up on nearby Odo Island journalist Hagiwara (Sachio Sakai) goes to investigate.[8] Hagiwara learns that the islanders blame the disasters on a mythical monster called Godzilla who they are attempting to appease via a ritualistic dance featuring performers in *tengu*-masks. While the Odo Islander's claims about Godzilla constitutes an example of 'fakelore' rather than authentic folklore, historian William Tsutsui writes that Godzilla nevertheless blends seamlessly with the 'giant serpent deities' and myriad 'dragons [of] water, land, and sky' that do comprise Japanese mythology (2004, 15).

That night, during a storm on the island, Hagiwara briefly spots Godzilla when the monster comes ashore. In response to Hagiwara's report the Japanese government dispatches a team of scientists to investigate including palaeontologist Dr. Kyohei Yamane (Takashi Shimura). Once on Odo Island, Dr. Yamane observes huge saurian footprints crisscrossing the terrain and discovers a living trilobite in one of them. He also notes that the footprints are highly radioactive. Dr. Yamane isn't on Odo Island long before Godzilla reappears, this time in broad daylight, peeking over a nearby cliff before disappearing back into the sea.

Based on his observations Dr. Yamane returns to Tokyo where he briefs the government officials at the Japanese Diet on what he has learned. Showing them a photo of the monster, Dr. Yamane postulates that it is 'a creature somewhere between the marine reptiles and the evolving terrestrial animals' of the Cretaceous period which 'probably survived by eating deep sea organisms occupying a specific niche'. He also connects it 'to Odo Island folklore' and thereby christens the monster 'Godzilla'. Dr. Yamane then continues to elaborate upon his theory, showing off the trilobite he recovered from Godzilla's footprint and explaining that the sand extracted from its shell contains traces of 'Strontium-90' a radioactive isotope 'generated only from an atomic bomb' which leads him to 'speculate that a hydrogen bomb explosion' is likely responsible for driving Godzilla to the surface.

As Takayuki Tatsumi observes, in Dr. Yamane's speech 'the initial scenario of radioactivity from the nuclear blast suddenly mutating the dinosaur [is] never explicitly spelled out' (2017, 70). However, Dr. Yamane's references to 'brontosaurus and… other dinosaurs', accompanied by slides featuring Yale's Peabody Museum of Natural History palaeoartist Rudolph F. Zallinger's paintings of dinosaurs, strongly suggests this idea. More specifically, Dr. Yamane appears to believe that Godzilla represents a transitional form between terrestrial dinosaurs and Mesozoic marine reptiles; a notion which is phylogenetically erroneous though perhaps not quite as egregious as the palaeontologist's blatantly false assertion that non-avian dinosaurs were roaming the earth as recently as 2-million years ago.

It was likely Kayama's interest in cryptids that was behind Dr. Yamane's additional argument that the recent 'discovery in the Himalayas of alleged "snowman footprints"' supports his conclusion that Godzilla is a living dinosaur. Following their collaboration on *Godzilla*, Kayama and director Honda would reunite the following year to make another monster movie, *Half Human* (*Jūjin yuki otoko*), about a yeti-like creature in the Japanese Alps (Ryfle, Godziszewski and Honda-Yun 2017, 113–18). Though a difficult film to see today *Half Human* exerted a powerful influence on those who did watch it during its brief U.S. run. One such viewer was a 12-year-old Loren Coleman who would grow up to become the founder and director of the International Cryptozoology Museum in Maine

and one of the most prolific and popular cryptozoologists working today (2003, 2). It could also be argued that *Half Human* helped lay the groundwork for the emergence of a new Japanese version of Bigfoot called the Hibagon which was sighted multiple times in the 1970s around Mount Hiba in the Hiroshima Prefecture (Coleman and Huyghe 1999, 132–33; Freeman 2010, 96–98; Higashitani 2020).

Dr. Yamane returns in the franchise's second film, *Godzilla Raids Again* (Dir. Motoyoshi Oda, 1955) just long enough to confirm the Japanese government's fears that a second Godzilla has been discovered following the death of the first one at the climax of the 1954 film. To make matters worse a second kaijū, Anguirus, has also appeared and been identified as a type of ankylosaurus, thus establishing the kaijū genre's adherence to the 'prehistoric survivor paradigm' of cryptozoology. Going forward many classic Toho kaijū would adhere to this trope including Rodan, Varan, Baragon, Gorosaurus, and Titanosaurus. However, as Mark Berry observed, 'Godzilla's connections to his prehistoric origins faded into nothingness after the first few films, and only rarely did a special guest monster appear which could even loosely be called a dinosaur' (2002, 4 & 449–52).

But while Godzilla's dinosaurian origins faded into the background during his initial fifteen film run (1954–1975), Toho's rebooted second series of seven Godzilla films (1984–1995) would revive the issue, placing new emphasis on Godzilla's connections to cryptozoology and its heterodox implications for the field of palaeontology. This series of Godzilla films also serves as an example of the franchise's propensity to oscillate between cutting-edge palaeontology and what Gordin refers to as 'vestigial science' composed of those scientific ideas which while once deemed credible are no longer seen as 'productive or correct' (2021, 15–6).

In *The Return of Godzilla* (Dir. Koji Hashimoto, 1984), Godzilla's sudden reappearance after a nearly 30-year absence throws the Cold War powers of the United States and Russia into a tailspin with Japan serving as a reluctant middleman. Brash, young reporter Goro Maki (Ken Tanaka) has the inside scoop but is barred by the Japanese government from publishing due to concerns that the revelation that Godzilla is alive and well may cause an international panic.

Biding his time, Maki visits biologist Prof. Makoto Hayashida (Yosuke Natsuki) to learn more about Godzilla. Like Dr. Yamane, Prof. Hayashida never openly declares Godzilla a 'radioactive dinosaur,' but the insinuation is clearly present. Prof. Hayashida's lab is full of miniature model fossil skeletons of various extinct species, and a coffee table in the room is covered with books on dinosaurs. When Maki asks the professor if he thinks Godzilla is a biological animal, Hayashida says yes but clarifies that due to his exposure to radiation Godzilla has been transformed into a 'living nuclear weapon'. Hayashida then passes Maki a copy of David Lambert's book *Dinosaurs* (1978) while intoning that he has come to believe that Godzilla is 'immortal' with the implication being that not only is Godzilla an extant dinosaur but one which has been around for millions of years.

Using this information, the film's heroes formulate a plan to defeat Godzilla that makes use of the theory that birds are the evolutionary descendants of dinosaurs. Noting that Godzilla appears to follow the same migratory routes as birds, Prof. Hayashida theorises that Godzilla has a similar 'homing' instinct that if correctly manipulated could effectively trick Godzilla into going wherever they tell him to, including walking straight into the mouth of an active volcano – which is exactly what they do!

The Return of Godzilla was released eight years before *Jurassic Park* (1993) would popularise the idea that birds are the evolutionary descendants of dinosaurs. In fact, this line of thinking about dinosaurs was so cutting-edge that the American team at New World Pictures tasked with dubbing the film for its subsequent 1985 U.S. release admitted having trouble understanding this element of the screenplay (Homenick 2009, 26–7).

However, the same year that *Jurassic Park* was released in theaters, Toho debuted *Godzilla vs. Mechagodzilla II* (Dir. Takao Okawara, 1993). In this film a scientific expedition recovers a gigantic

prehistoric egg which eventually produces an infant Godzilla. By studying this infant, the scientists at the United Nations Godzilla Countermeasures Center (UNGCC) learn that Godzilla's species has two brains; one located in the skull and another at the base of the spine. The UNGCC then plan to attack Godzilla's second brain in the hope of paralyzing the monster.

The idea that Godzilla would have two brains is a perfect example of 'vestigial science' as it is based on an obsolete but nevertheless real-life hypothesis about dinosaurs developed by renowned nineteenth-century Yale palaeontologist Othniel Charles Marsh who observed that many of the biggest dinosaurs had an unusually large medullar cavity in the sacropelvic region of their bodies. Furthermore, because the heads of these giant dinosaurs seemed absurdly small for their massive bodies Marsh concluded that this sacral cavity must have housed a second brain which controlled the back half of their bodies while the one in their skull controlled the front half (Buchholtz 2012, 205–06).

While taken seriously at the time, Marsh's double-brain hypothesis was hopelessly out-of-date by 1993 having been challenged as early as the late 1930s and wholly discounted by the late 1980s. Nevertheless, the myth of the two-brained dinosaur persists to this day popping up as recently as 2013 when it was invoked by biologist Dr. Newton Geiszler (Charlie Day) in the Hollywood kaijū film *Pacific Rim* (Dir. Guillermo del Toro).

The film *Godzilla vs. King Ghidorah* (Dir. Kazuki Ohmori, 1991) introduces overt cryptozoology into its plot as well as the element of time-travel. Visitors from the year 2204 come back to warn the Japanese that in the near future Godzilla will completely destroy Japan. To prevent this the time-travelers propose going back to the year 1944 and relocating the extant dinosaur that would become Godzilla to another island in the South Pacific where it won't be exposed to radiation from atomic bomb tests. Along for the ride are paranormal journalist Kenichiro Terasawa (Kosuke Toyohara) and the maverick Prof. Mazaki (Katsuhiko Sasaki); having previously published a monograph arguing against the scientific consensus that dinosaurs went extinct 66 million-years-ago.[9]

Mazaki's conviction that some non-avian dinosaurs survived extinction is based mostly on eyewitness accounts – the bedrock of cryptozoology – collected from surviving Japanese soldiers stationed on Lagos Island during WWII. These veterans claim to have witnessed a theropod dinosaur fight off an American military platoon thereby saving the Japanese troops stationed on the island. However, Mazaki's other key piece of evidence is a real-life Japanese cryptozoological cold case known as the Zuiyo-Maru Incident.

On April 25, 1977, the Zuiyo-Maru, a Japanese fishing trawler, snared the carcass of a huge animal measuring 33-feet-long and weighing 4,000 pounds in its nets 30-miles off the coast of Christchurch, New Zealand. To many of the men on board the decaying remains resembled those of a plesiosaur. Once in the open air, however, the smell emanating from the corpse was so bad that the crew quickly discarded it, though not before it was photographed and some skin samples were taken (Coleman and Clark 1999, 257–58; Newton 2005, 508–09). When these photos were released to the Japanese press it created a commotion with the media dubbing the carcass 'New Nessie' (*Nyu Nesshii*).[10]

Despite several mainstream Japanese scientists initially lending their support to the plesiosaur hypothesis, subsequent analysis of the skin samples collected by the crew revealed the animal to be a dead basking shark, the carcass of which often takes the shape of a 'pseudo-plesiosaur' (Naish 2017, 61–3). However, as often happens in cryptozoology the solution to the mystery was not as widely publicised as the mystery itself, causing it to endure all the way into the early 1990s when it was referenced in *Godzilla vs. King Ghidorah*.

Conclusions

On February 13, 1958, at about 7:00 PM, Mitsuji Matsumoto, captain of the Japanese Antarctic research vessel *Soya*, stood on the bridge alongside the ship's navigator, chief engineer, and helmsman. The four

men were looking out into the Lutzow-Holm Bay where they had spotted a large black object moving through the water about 300 meters ahead of the *Soya*. Matsumoto would describe the creature as resembling a whale, but with a serrated fin on its back, and a head like a cow's complete with protruding ears. As is often the case with such encounters, no one had a camera on them, and when the chief engineer left to retrieve one the U.M.A. in question had vanished by the time he returned. Reminded of the monster in Toho's recent film Matsumoto subsequently christened the creature *Nankyoku Gojira* or 'Antarctic Godzilla' (Storrs, Carnicelli, and Morphy 2023).

Matsumoto's Antarctic Godzilla is not well known to cryptozoologists outside of Japan but nevertheless serves as an example of the feedback loop which exists between fringe scientific fields like cryptozoology and science-fiction films like *Godzilla* (May 2017, ix). In this case four men shared a sighting of an unknown animal, one which conspicuously bore a superficial resemblance to a popular movie monster in a current hit film. Instances such as these are far more common in the annals of cryptozoology than most people probably realise (Mullis 2019, 240–52). Though there have been no subsequent sightings of Godzilla's Antarctic doppelganger, the incident has been interpreted as a precursor to the Ningen; another kaijū-sized aquatic cryptid which has come to occupy a more prominent place in the Japanese imagination since the mid-2000s (Greenland and Hayward 2020, 139).

Since the end of the second Godzilla series in 1995, Toho has produced an additional eight live-action feature films in the franchise as of 2023. Not all these films contain cryptozoological or heterodox palaeoscience elements, but some do.[11] Moreover since 2014 Legendary Pictures, in conjunction with Toho and Warner Brothers, has been producing their own series of Hollywood Godzilla movies constituting a new 'cinematic universe' called the MonsterVerse. A tie-in TV series, *Monarch: Legacy of Monsters* (2023–24), marked the first time the word 'cryptozoology' was used on-screen in conjunction with the MonsterVerse, though the films make it clear that the creative teams behind these movies have been heavily influenced by cryptozoology, most notably via the introduction of several new kaijū who are modeled off existing cryptids including Scotland's Loch Ness Monster, Australia's Bunyip, Africa's Mokèlé-mbèmbé, and South America's Mapinguari.[12]

The notion of 'cryptozoology' is also invoked, briefly, in the anime series *Godzilla: Singular Point* (2021), distributed by Netflix, which sets its story in motion when a 'heretical researcher' named Michiyuki Ashihara vanishes shortly before Godzilla and various other familiar monsters – Rodan, Angurius, the sea-serpent Manda, etc. – begin to appear in Japan. Unlike past incarnations, this series presents the monsters more like yōkai or U.M.A. than kaijū, including explicitly connecting them to Japanese folklore. A key plot point, introduced early in the show, revolves around a re-imagined version of artist Utagawa Kuniyoshi's famous *ukiyo-e* print 'Tametomo Rescued by Tengu from Sanuki-no-in' (1850) with the well-known yōkai *wani* (shark-crocodile) and *tengu* re-imagined as Godzilla and Rodan respectively.

Considering the respective domestic and international box office success of both Toho's Godzilla series as well as Warner Brother's MonsterVerse there can be little doubt that both Japan and Hollywood will continue producing more media in the Godzilla franchise. As they do these productions will certainly continue to occasionally serve as disseminators for heterodox palaeoscience and as a template for aspiring cryptozoologists.

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Notes

1. In this way Inoue's explanation anticipates the psychosocial hypothesis (PSH) of modern ufology and some more critical cryptozoologists like Ulrich Magin.
2. The "dog-god" referenced here is a yōkai known as the Inugami, whose existence was investigated by the famed Tokugawa era naturalist Ono Ranzan (1729–1810); sometimes referred to as the "Japanese Linnaeus" (Plutschow 2006, 16).
3. Oishigori Masuumi's ideas anticipate those of certain Ancient Alien proponents like R.A. Boulay (Smith-Spark 2009, 37-8).
4. Some cryptozoologists continue to cite this story as possibly authentic (Shuker 1995, 35-7).
5. A long-standing mistranslation has resulted in multiple English sources claiming that the Xiao are winged monkeys a la *The Wizard of Oz* (Mair 2013).
6. *King Kong* was released in Japan by Shochiku Films in 1935 where it inspired two unauthorized (and now lost) Japanese-made sequels (Kobayashi 2019, 79 & 108).
7. Revised in 1948 as *The Lungfish, the Dodo and the Unicorn*. It is also worth noting that this section of Ley's book was itself mostly recycled information from German science-writer Wilhelm Bölsche's *Drachen, Sage und Naturwissenschaft* ("Dragons: Legend and Natural Science," 1929).
8. To distinguish between diegetic and non-diegetic individuals all characters appearing in movies will have the name of the actor or actress who portrayed them appear in brackets following their first reference.
9. Specifically, Terasawa works for *Mu* magazine, the Japanese equivalent of *The Fortean Times* (Japan Times, 2021).
10. In an interesting bit of synchronicity, the Zuiyo-Maru Incident occurred around the time that Toho was contemplating co-producing a movie about the Loch Ness Monster with Britain's Hammer Studio. Tragically this project never came to fruition (LeMay 2020b, 27-36 & 108-15).
11. In *Godzilla, Mothra, King Ghidorah: Giant Monster's All-Out Attack*'s (Dir. Shusuke Kaneko, 2001) Mothra, while in her caterpillar form, is identified as the lake monster Issie.
12. Admittedly these creatures have received little to no screentime in the films themselves but have been more prominently featured in tie-in media including comic books and the novelization of the third film in the series, *Godzilla: King of The Monsters*, written by Greg Keyes.

References

Angles, Jeffrey. 2023. "Afterword." In *Godzilla and Godzilla Raids Again: The Original Novels*, edited by Shigeru Kayama, 189–221. Minneapolis: University of Minnesota Press.

Baker, J. I., and Joel Van Liew. 2019. "Godzilla: The King of the Monsters." *Life* 10 (15).

Barry, Mark F. 2002. *The Dinosaur Filmography*. Jefferson, NC: McFarland.

Benzon, William L. 2011. "Dr. Tezuka's Ontology Laboratory and the Discovery of Japan." In *Mangatopia*, edited by Timothy Perper, and Martha Cornog, 37–51. Santa Barbara: ABC-CLIO.

Birrell, Anne. 2000. *The Classic of Mountains and Seas*. London, UK: Penguin.

Buchholtz, Emily. 2012. "Dinosaur Paleoneurology." In *The Complete Dinosaur*, edited by James O. Farlow, Michael K. Brett-Surman, and Thomas R. Holtz, 191–208. Bloomington: Indiana University Press.

Cohen, Daniel. 1967. *Myths of the Space Age*. New York: Tower Books.

Coleman, Loren. 2003. *Bigfoot!: The True Story of Apes in America*. New York: Paraview Pocket Books.

Coleman, Loren, and Jerome Clark. 1999. *Cryptozoology A to Z*. New York: Fireside Books.

Coleman, Loren, and Patrick Huyghe. 1999. *The Field Guide to Bigfoot, Yeti, and Other Mystery Primates Worldwide*. New York: Avon Books.

Derendorf, Kevin. 2022. "Maser Patrol podcast 57: Japanese Dinosaur Movies at G-Fest XXVII," YouTube, Aug 19, 2022. https://www.youtube.com/watch?v=s4imm20mvyg&t=1703s.

Dobler, Russ. 2014. "Holding Out Hope for Bigfoot," *The Pulp*. April 7, 2014. https://thepulpyeg.wordpress.com/2014/04/07/holding-out-hope-for-bigfoot/.

"Editor of occult fanzine Mu makes a pitch for 'conspiracy literacy," *Japan Today* (Feb. 22, 2021) https://japantoday.com/category/features/kuchikomi/editor-of-occult-fanzine-mu-makes-a-pitch-for-conspiracy-literacy

Fallon, Richard. 2023. "Discovering the Living Fossil Short Story in the Late Nineteenth Century." *Comparative American Studies: An International Journal*, https://doi.org/10.1080/14775700.2023.2247781.

Figal, Gerald. 1999. *Civilization and Monsters*. Durham, NC: Duke University Press.
Foster, Michael Dylan. 2009. *Pandemonium and Parade*. Oakland: University of California Press.
Foster, Michael Dylan. 2015. *The Book of Yōkai*. Oakland: University of California Press.
Freeman, Richard. 2010. *The Great Yōkai Encyclopedia*. Bideford, UK: CFZ Press.
Godart, G. Clinton. 2017. *Darwin, Dharma, and the Divine*. Honolulu: University of Hawai'i Press.
Gordin, Michael D. 2021. *On the Fringe*. Oxford: Oxford University Press.
Greenland, Felicity, and Philip Hayward. 2020. "Ningen: The Generation of Media-Lore Concerning a Giant, Sub-Antarctic, Aquatic Humanoid and its Relation to Japanese Whaling Activity." *Shima: The International Journal of Research into Island Cultures* 14 (1): 134–51. https://doi.org/10.21463/shima.14.1.10
Grimshaw, Roger, and Paul Lester. 1976. *The Meaning of the Loch Ness Monster*. Birmingham, UK: Centre for Contemporary Cultural Studies.
Higashitani, Kohei. 2020. "Japan's 'Bigfoot' Still Influences Hiroshima Town After 50 Years." *The Asahi Shimbun*. (Aug. 13, 2020). https://www.asahi.com/ajw/articles/13584940.
Hill, Sharon A. 2017. *Scientifical Americans*. Jefferson, NC: McFarland.
Hirota, Ryūhei. 2021. "Traversing the Natural, Supernatural, and Paranormal: *Yōkai* in Postwar Japan." *Japanese Journal of Religious Studies* 48 (2): 321–40. https://doi.org/10.18874/jjrs.48.2.2021.321–339
Homenick, Brett. 2009. "Adapting Godzilla 1985" *G-Fan* #87 (Spring) Daikaiju Enterprises: 26-8.
Josephson-Storm, Jason Ā. 2012. *The Invention of Religion in Japan*. Oakland: University of Chicago Press.
Josephson-Storm, Jason Ā. 2017. *The Myth of Disenchantment*. Oakland: University of Chicago Press.
Josephson-Storm, Jason Ā. 2019. "The Mystical 'Occident' or the Vibrations of 'Modernity' in the Mirror of Japanese Thought." In *Spirits and Animism in Contemporary Japan*, edited by Fabio Rambelli, 29–44. London: Bloomsbury Academic.
Keyes, Greg. 2019. *Godzilla: King of The Monsters*. London: Titan Books.
Kobayashi, Kagami Jigoku. 2019. *Carnal Curses, Disfigured Dreams: Japanese Horror and Bizarre Cinema 1898-1949*. N/A: Shinbaku Books.
Kobayashi, Teiichi. 1976. "Introduction to the History of Paleontology in Japan." In *A Concise History of Paleontology in Japan*, edited by Tatsurō Matsumoto, 1–10. Tokyo: Palaeontological Society of Japan.
LeMay, John. 2020a. *Cowboys & Saurians: Ice Age*. Roswell, NM: Bicep Books.
LeMay, John. 2020b. *Jaws Unmade*. Roswell, NM: Bicep Books.
Loxton, Daniel, and Donald R. Prothero. 2013. *Abominable Science!*. Columbia University Press. 2013.
Mair, Victor H. 2013. "Hsigo, the Imaginary Flying Monkeys of Chinese Mythology." *Language Log*. (Oct. 14, 2013): https://languagelog.ldc.upenn.edu/nll/?p=7831
Marcon, Federico. 2015. *The Knowledge of Nature, and the Nature of Knowledge in Early Modern Japan*. Oakland: University of Chicago Press.
May, Andrew. 2017. *Pseudoscience and Science Fiction*. Switzerland: Springer.
Mullis, Justin. 2019. "Cryptofiction! Science-Fiction and the Rise of Cryptozoology." In *The Paranormal and Popular Culture*, edited by Darryl Caterine, and John W. Morehead, 240–52. New York: Routledge.
Naish, Darren. 2017. *Hunting Monsters*. London: Sirius Publishing.
Nappi, Carla. 2009. *The Monkey and the Inkpot*. Cambridge: Harvard University Press.
Nardy, Deanna T. 2021. "Tarzan and Japan." In *Japanese Visual Media*, edited by Jennifer Coates, and Eyal Ben-Ari, 70–94. New York: Routledge.
Newton, Michael. 2005. *Encyclopedia of Cryptozoology: A Global Guide*. Jefferson, NC: McFarland.
Plutschow, Herbert E. 2006. *A Reader in Edo Period Travel*. Kent, UK: Brill.
Ritchie, Donald. 2005. *A Hundred Years of Japanese Film*. Tokyo: Kodansha International.
Ryfle, Steve. 1998. *Japan's Favorite Mon-Star*. Toronto: ECW Press.
Ryfle, Steve, Ed Godziszewski, and Yuuko Honda-Yun. 2017. *Ishiro Honda: A Life in Film, from Godzilla to Kurosawa*. Middletown, CT: Wesleyan University Press.
Sanderson, Ivan T. 1948. "There Could Be Dinosaurs," *The Saturday Evening Post* (Jan. 1948): 17, 53, and 56.
Schnellbächer, Thomas. 2007. "Has the Empire Sunk Yet?—The Pacific in Japanese Science Fiction." In *Robot Ghosts and Wired Dreams: Japanese Science Fiction from Origins to Anime*, 27–46. Minneapolis: Minnesota University Press.

Shay, Don, and Jody Duncan. 1993. *The Making of Jurassic Park*. New York: Ballantine Books.

Shuker, Karl. 1995. *In Search of Prehistoric Survivors: Do Giant 'Extinct' Creatures Still Exist?* London: Cassell Illustrated.

Smith-Spark, Anna. 2009. "And Dinosaurs Created Man," *Fortean Times* no. 246 (April 2009): 34–39.

Stalker, Nancy K. 2008. *Prophet Motive: Deguchi Onisaburo and the Transformation of Religion in Modern Japan*. Honolulu: University of Hawai'i Press.

Storrs, Marc, Chris Carnicelli, and Rob Morphy. 2023. "Kaiju Chaos: Antarctic-Zilla vs. Kabagon," *Cryptonaut Podcast* Ep. 287 (April 24, 2023). https:// cryptonautpodcast.com/podcast-episodes/287-kaiju-chaos-antarctic-zilla-vs-kabagon/

Suzuki, Eishiro. 1908. *Mysterious World: Strange Stories*. Tokyo: Seikado. https://dl.ndl.go.jp/pid/885790

Tatsumi, Takayuki. 2006. "Waiting for Godzilla: Towards a Globalist Theme Park." In *Full Metal Apache*, edited by Takayuki Tatsumi, 171–84. Durham, NC: Duke University Press.

Tatsumi, Takayuki. 2014. "On the Monstrous Planet, Or How Godzilla Took a Roman Holiday." In *The Liverpool Companion to World Science Fiction Film*, edited by Sonja Fritzsche, 69–88. Oxford: Oxford University Press.

Tsutsui, William. 2004. *Godzilla on My Mind: Fifty Years of the King of Monsters*. New York: Palgrave.

Warren, Bill. 2017. *Keep Watching the Skies!*. Jefferson, NC: McFarland.

Yoda, Hiroko, and Matt Alt. 2017. *Japandemonium Illustrated: The Yōkai Encyclopedias of Toriyama Sekien*. Mineola, NY: Dover.